Energy level alignments at tris-(8-hydroquinoline) aluminum/8-hydroquinolatolithium/aluminum interfaces

이연진¹, 조광희², 조상완³, 전평은¹, 이현복³, 황정남³, 정광호³
¹한국표준과학연구원, ²하이닉스반도체, ³연세대학교

The electronic structures of tris-(8-hydroquinoline) aluminum (Alq₃)/8-hydroquinolatolithium (Liq)/Al interfaces were studied using in situ ultraviolet and x-ray photoelectron spectroscopy. We constructed complete energy level diagrams and analyzed chemical interactions at the interface. When Liq was inserted between Al and Alq₃, the electron injection barrier was reduced by 0.56 eV compared to the structure without Liq. Additionally, a gap state was observed in the gap of Liq, which is related to an interfacial reaction. The N 1s spectra revealed that there were destructive chemical reactions between Alq₃ and Al, which could be prevented by inserting Liq between them.